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ABSTRACT

A study determined the economic impact of each dollar invested in Literacy Volunteers of America, Inc. (LVA). The analysis included 217 interviews, 165 in New York and 52 in Wisconsin; analysis of economic impact; and statistical validation and analysis. For every dollar spent by LVA, the value created (return) to the overall economy was a multiple of approximately 11 and ranged from 5-41. Tutors improved the multiple to 33 by donating their time, and the range improved to 15-125. The economic impact ratio was approximately consistent between New York and Wisconsin but varied somewhat, depending on the goals and outcomes of students. Overall, students were very satisfied with the economic improvements they had realized as a result of LVA's efforts. Students also experienced significant improvements in their basic skills, as well as in their roles as parents, citizens, and employees. LVA was the primary source of the improvements in most aspects of students' lives. Learners acquired survival skills, participated more actively in their children's education, enhanced their employment skills, showed a significant increase in job satisfaction, and became more involved in their communities. Numerous graphs are provided throughout. (Contains an 11-item bibliography.) (YLB)

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ED 440 300

Literacy Volunteers of America, Inc.

Economic Impact Analysis

Project Report

August 3, 1999

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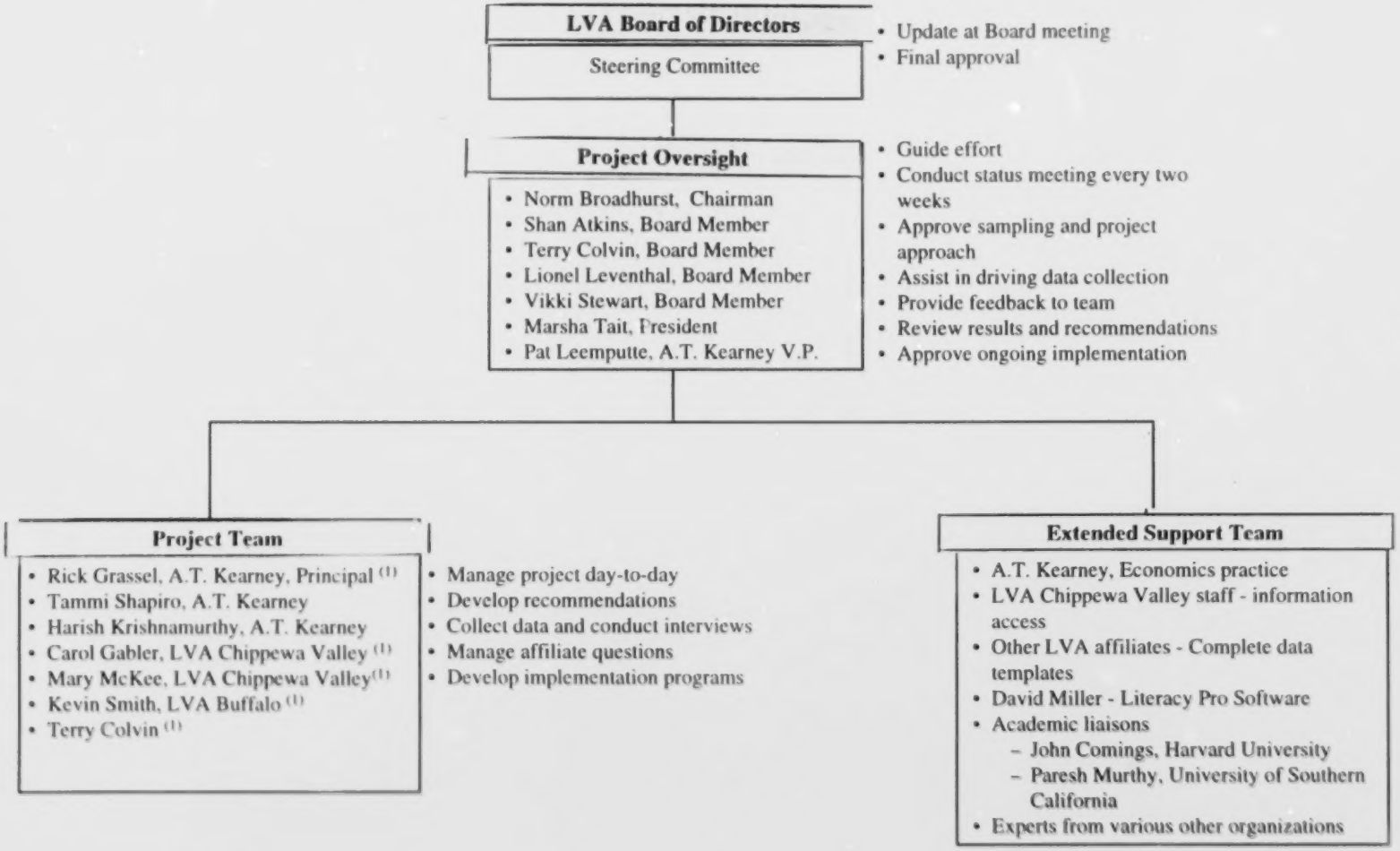
The Project Team has been a partnership between A.T. Kearney and LVA, with assistance from the Extended Support Team


LVA Board of Directors
Steering Committee
• Update at Board meeting
• Final approval
Project Oversight
• Norm Broadhurst, Chairman
• Shan Atkins, Board Member
• Terry Colvin, Board Member
• Lionel Leventhal, Board Member
• Vikki Stewart, Board Member
• Marsha Tait, President
• Pat Leemputte, A.T. Kearney V.P.
• Guide effort
• Conduct status meeting every two weeks
• Approve sampling and project approach
• Assist in driving data collection
• Provide feedback to team
• Review results and recommendations
• Approve ongoing implementation
Project Team
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• Tammi Shapiro, A.T. Kearney
• Harish Krishnamurthy, A.T. Kearney
• Carol Gabler, LVA Chippewa Valley (1)
• Mary McKee, LVA Chippewa Valley (1)
• Kevin Smith, LVA Buffalo (1)
• Terry Colvin (1)
• Manage project day-to-day
• Develop recommendations
• Collect data and conduct interviews
• Manage affiliate questions
• Develop implementation programs
Extended Support Team
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• LVA Chippewa Valley staff - information access
• Other LVA affiliates - Complete data templates
• David Miller - Literacy Pro Software
• Academic liaisons
– John Comings, Harvard University
– Paresh Murthy, University of Southern California
• Experts from various other organizations

Note: (1) Part-time

Acknowledgements — Various members of the Extended Support Team have provided significant assistance and expertise in conducting this study

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Note: (1) NCSALL, National Center for the Study of Adult Learning and Literacy

Executive Summary

Introduction

- Literacy Volunteers of America, Inc. (LVA) is a national network of more than 360 local literacy programs that assist adults and their families to acquire literacy skills through volunteer tutors
  - Basic literacy skills: Reading, writing, English proficiency, mathematical and computer skills
  - Variety of other survival skills focused on improving the ability of the adult to function effectively as a parent, citizen, and employee
  - Literacy instruction is provided free of charge
- LVA students have a variety of backgrounds ranging from
  - No formal education to PhDs and other advanced degrees
  - Native residents to immigrants from non-English and English speaking countries
  - No work experience, to farming, to hourly employees, to self-employed businessmen, to others
- Typical goals of LVA students range from
  - Increasing self-esteem
  - Getting a job, enhancing career opportunities
  - Reading to children, participating in school activities, being a better role model
  - Improving basic skills and pursuing higher education
- An easily quantifiable Economic Impact varies significantly across students
  - Some students who want to improve their self confidence or be better role models for their children may not experience any direct easily quantifiable Economic Impact
  - Some students who want to improve basic skills and obtain a job or improve their career may, over time, improve their earnings and thus experience some easily quantifiable Economic Impact
  - Some students may end up furthering their education and obtaining significantly better jobs, and thus experience significant easily quantifiable Economic Impact
- Economic Impact does not comprehensively capture the benefits and should be analyzed in context
  - Indirect Economic Impact or secondary impact (for example reading to children, being a better role model, etc.) is difficult to measure and can be socially and economically significant
  - Qualitative benefits (for example improving job satisfaction, improving health practices, being more involved in the community) may not easily be captured in economic terms, but are arguably significant to society
- The current initiative is a pilot study to estimate an easily quantifiable Economic Impact of the services that LVA provides to society at a rough order of magnitude

Scope - Issues addressed in the LVA study

This study is...

- A directional estimate of the economic impact of each dollar invested by LVA based on
  - Historical and future expected economic benefits
  - Reduction in dependence on public assistance
- A baseline or pilot for future work to further analyze economic impact
- A conservative measure of overall impact
  - Indirect/Secondary Economic Impacts are not quantified (i.e., reading to children, gaining consumer skills, etc.)
  - Incremental future accomplishments of active students are not included
- A qualitative measure of LVA contribution to individuals' social improvement in Equipped For Future (EFF) paradigm (worker, citizen, and family roles), as well as individuals' overall satisfaction with the quality of the instruction received
- An extrapolation of a practical sample size to a national level
- Accurate based on data provided — no further efforts were attempted in verifying either data provided by LVA students or by LVA

This study is not intended to...

- Measure or compare impact at an individual affiliate or regional level
- Measure the effectiveness of the LVA Accreditation Initiative
- Measure the impact of public policies at a national, state or local level
- Measure the efficiency of LVA operations or cost structure
- Measure the effectiveness of tutors and learners in LVA programs
- Identify a precise annual impact isolated from the impact from previous years
- Provide a detailed analysis of the Equipped For Future (EFF) paradigm

The primary objective of this study is to determine the economic impact of each dollar invested in LVA

Summary of findings

Key Findings
▪ The quantitative results vary depending on key underlying assumptions
▪ For every dollar that is spent by LVA, the value created (return) to the overall economy is a multiple of approximately 11 and ranges from 5 to 41 (making various input assumptions)
▪ Tutors further improve the multiple to 33 by donating their time and the range improves to 15 to 125
▪ The economic impact ratio is approximately consistent between New York and Wisconsin
▪ Overall, students are very satisfied with the economic improvements they have realized as a result of LVA's efforts
▪ Students have also experienced significant improvements in their basic skills as well as in their roles as parents, citizens, and employees
▪ LVA has been the primary source of the improvements in most aspects of the students' lives

Methodology
▪ The analysis was conducted with a total of 217 interviews, 165 in New York and 52 in Wisconsin
▪ Statistical techniques indicated that students receiving ESOL instruction, along with inactive students had higher economic impact ratios
▪ ESOL and basic literacy students are statistically represented in the data sample
▪ Inactive students are under-represented in the sample data. To be conservative, the final economic impact numbers were not adjusted upwards
▪ Profiles of the sample data were compared with LVA national data which identified few less critical variables that may not be adequately represented. This difference is not expected to change the economic impact ratio significantly
▪ Future studies should be designed to incorporate various other issues such as geographical differences, survey methodology, current employment status of former students, etc.

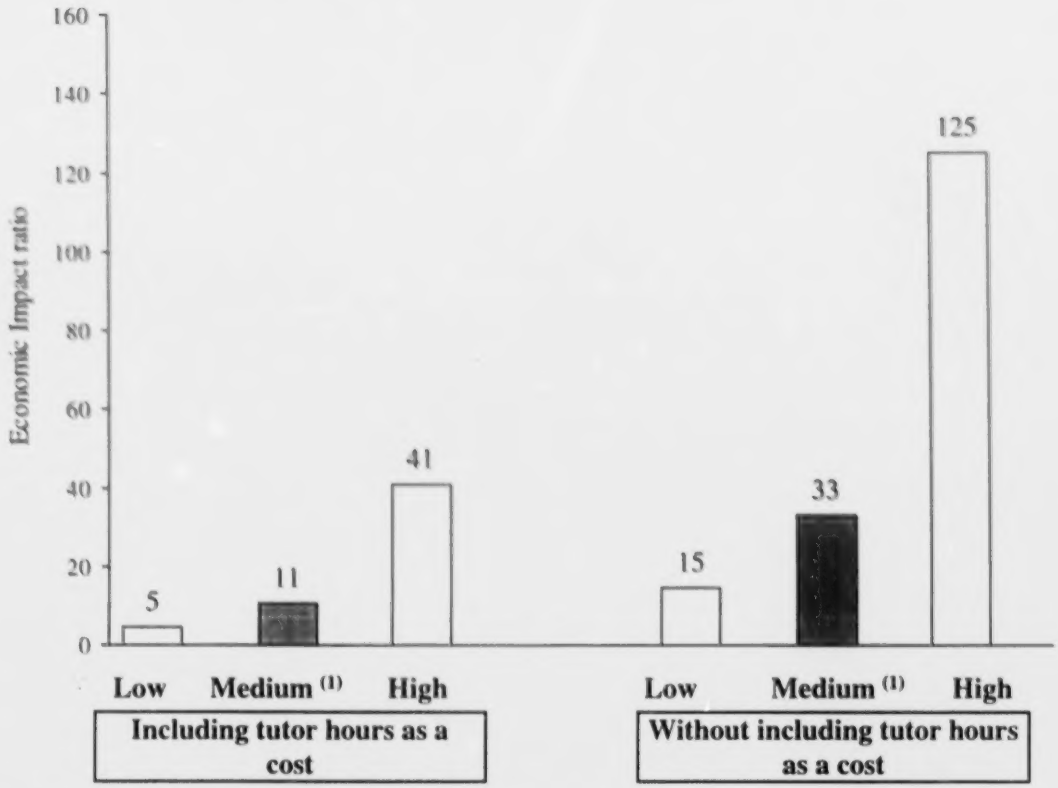
Quantitative findings

Economic Impact ratio ranges from 5 to 41 assuming tutor hours are included as a cost and from 15 to 125 when tutor hours are not included as a cost

Conceptual Calculations

Economic Impact =

$$\frac{\text{Economic Benefits}}{\text{LVA costs}}$$



For every dollar that is spent by LVA, the value created (return) to the overall economy is a multiple of 11; tutors are further improving the multiple to 33 by donating their time

Note: (1) Statistically, at a 90% confidence interval, the mean economic impact will be within the range of 10.7+/-2.7 when tutor hours are included as a cost and within the range of 33+/- 8.4 when tutor hours are not included as a cost. Confidence interval indicates that if the sample is repeated multiple times, 90% of the times, the mean will fall within the specified range

A.T. Kearney 7/29299/B 10

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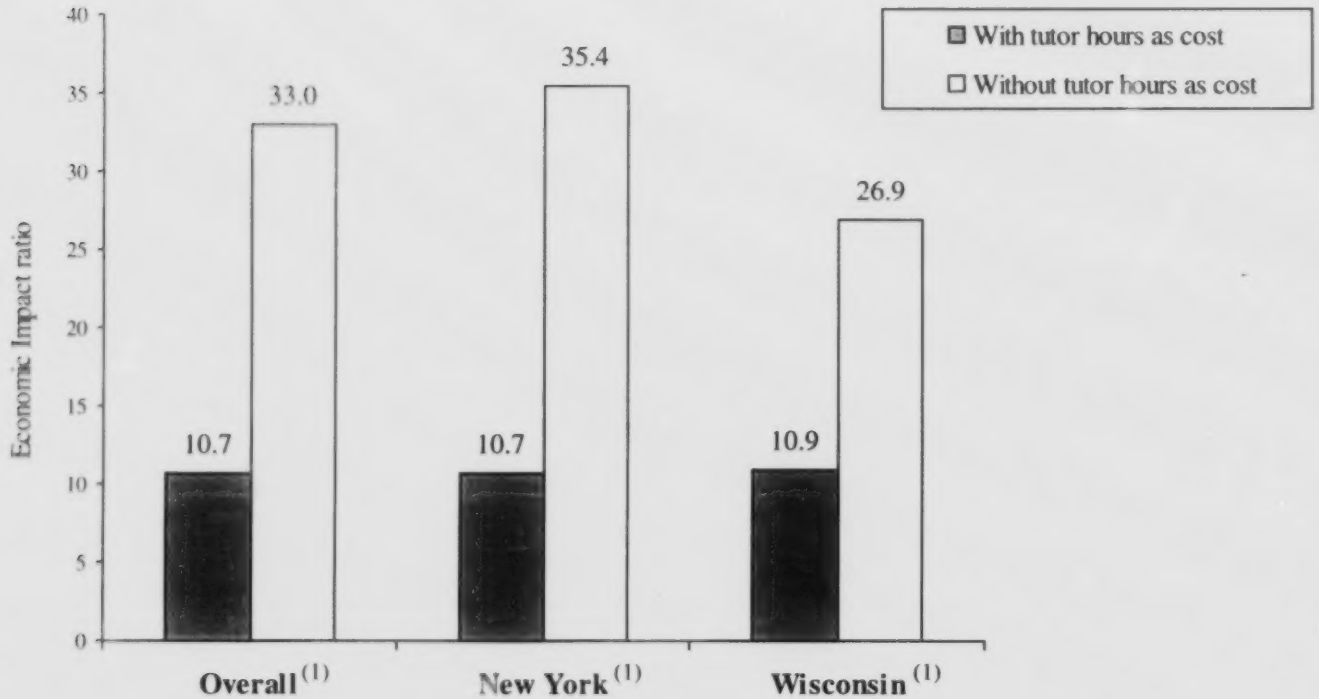
The Economic Impact indicated is very conservative as all assumptions were selected carefully and were restrained to provide a conservative estimate

- Benefits have been calculated from easily quantifiable variables (i.e., earnings and reductions in dependence on public assistance); the impact of non-quantifiable benefits (i.e., reading to children, voting, participating in the community, etc.) have not been included in the economic impact calculation
- Volunteer tutor hours have been included as an LVA expense in some calculations for comparison purposes
- LVA's contribution to higher earnings, as reported by the interviewees, has been reduced in the low and middle scenarios to account for potential overstatement due to interview bias
- Assumptions for the economic wage multiplier were based on the lowest of the economic wage multipliers estimated by REMI
- Actual tutor hours have not been adjusted to reflect minor breaks in teaching due to vacation, tutor termination and other schedule conflicts
- Welfare benefits have not been projected into the future to account for Welfare Reform policies in Wisconsin and New York
- Future benefits have been limited to a five and ten year earnings horizon for the low and middle scenarios; effective retirement was only used in the high scenario
- Future benefits from enhanced earnings have been calculated at an annual productivity increase of 1%, 2% and 3% for the low, middle and high scenarios, respectively, though actual earnings enhancements experienced by students reflect increases of over 10% per year
- For students who were able to maintain their jobs as a result of literacy instruction from LVA, the assumption was made that they would be able to find an alternative job and receive wages between 70% (high scenario) and 80% (low scenario) of their original earnings (though there is no guarantee that these students would have found alternate employment)
- Inactive students, who have a higher economic impact as a group relative to active students, are under-represented in the sample; no adjustments have been made to reflect this
- Students who are currently employed full-time were under-represented in the sample due to availability constraints; no adjustments have been made to reflect this

Key assumptions in computing the Economic Impact ratio were varied to arrive at the ranges in economic impact

Category	Assumption	Low	Medium	High	Source
Earnings	NY-Real Annual Wage Increase	2.8%	2.8%	2.8%	Bureau of Labor Statistics
	WI-Real Annual Wage Increase	1.1%	1.1%	1.1%	Bureau of Labor Statistics
	Annual Productivity increase	1.0%	2.0%	3.0%	Lifetime earnings study (Dept. of Education)
	Effective Retirement age	62	62	62	Estimate based on Lifetime earnings study (Dept. of Education)
	Earnings horizon	5	10	effective retirement	Estimate
	WI - Obtain job earnings	*$ 8,786*	*$ 9,021*	*$ 9,256*	Data set
	NY - Obtain job earnings	*$ 11,897*	*$ 12,275*	*$ 12,653*	Data set
	Benefits as a proportion of paid salary	*10%*	*20%*	*30%*	Estimate
	Alternative lower wage for people who maintained job through LVA	80%	75%	70%	Estimate
	Economic wage multiplier effect	*1.467 =1.63-10%*	*1.63*	*1.793 =1.63+10%*	REMI
Public Assistance	NY-Annual Welfare increases	*2.8%*	*2.8%*	*2.8%*	Based on Annual NY wage increase estimates
	WI-Annual Welfare increases	*1.1%*	*1.1%*	*1.1%*	Based on Annual WI wage increase estimates
	WI-Welfare Reform implemented	1997	1997	1997	WI Dept. of Workforce Development
	NY-Welfare Reform implemented	1997	1997	1997	NY State Plan, NY State Dept. of Social Services
	Welfare reform limit (years)	2	2	2	WI Dept. of Workforce, NY State Dept. of Social Services
LVA Contribution	Adjustment of LVA contribution to reflect over estimation by Students	LVA contribution — 20% points	LVA contribution — 10% points	LVA contribution — 0% points	Estimate
Tutor/Student	Value ofVolunteer Tutor time ($/hour)	$ 13.14	$ 13.14	$ 13.14	Bureau of Labor Statistics
	Number of students in group sessions	3	5	7	LVA

Economic Impact ratios for New York and Eau Claire, Wisconsin are consistent with the overall Economic Impact ratio



Note: (1) Calculations based on mid level scenario

The economic impact varies depending on the goals and outcomes of the students

Outcome	Economic Impact[1] ratio	Total Benefits[1]	% of Total Benefits[1]	Number of Students
Obtain Job	16.6	$7.0M	38.2%	46
Maintain Job	16.4	$2.5M	13.4%	24
Enhance Job	17.6	$8.9M	48.3%	67
Other (No Impact, Reduce Public Assistance)	0.0	$0.0M	0.2%	80
Total	**10.7**	**$18.4M**	**100%**	**217**

Note: (1) Calculations based on mid level scenario with tutor costs included

Qualitative findings

The Economic Impact ratio does not reflect the extensive qualitative improvements students experience in their lives through LVA or the appreciation students have for LVA

Examples of Student-Reported Successes

- One highly-educated ESOL learner has been able to use her improved English skills to significantly advance her career
  - — She completed her BS in Chemical Engineering and MS in Environmental Engineering in the Dominican Republic
  - — Since leaving LVA she has gone back to college to complete her MS in teaching and is now a well-respected school teacher
- One ESOL learner enrolled in LVA with no English skills and has since become a star employee at his company
  - — He has received two promotions and has almost doubled his earnings in four years
  - — He has appeared on television commercials for his company
- One former LVA student went from receiving public assistance for the majority of her life to securing full-time employment and becoming very active in the community
  - — She is currently the Director of Special Services at a local college, a position she established as a work-study student while enrolled in the school
  - — She has also been involved in the local LVA board, spoken at a college graduation, given speeches for United Way and helped start VALUE
- One LVA learner credits LVA with giving him the skills and courage to get off the streets and make a better life for himself
  - — When he enrolled in LVA he was homeless and was drug and alcohol addict
  - — His self-confidence has improved considerably, and optimistic about finding a job in the near future
  - — He is now able to read to his daughter
  - — He is looking for ways to give back to the community

Reduction in dependence on public assistance saves $13K to $27K/year/student and can have significant economic impact

Examples of Key Quotes

- "LVA changed my life more than I ever thought it would…it brought me out of my shell."
- "[My tutor at LVA] knew what I needed even though I didn't; LVA gave me a real big boost." (Student went on to obtain GED and secure steady employment)
- "If I could talk to the President of the United States, I would tell him to make [LVA] his number one priority."
- "I think LVA is a great program for people like me. I know they care about people. This program helped me a lot to improve my basic skills. I met people who are now part of my community. I can share my problems with them. They are my family."
- "Everyday I wake up a little more. It's like another cable channel gets turned on in my mind."
- "This program has helped me so much that if I had to pay back in cash, I wouldn't know if there was enough."
- "I feel like LVA is my family."
- "LVA opened many windows for me, now I can *see* many more opportunities in my life."
- "This program builds self-confidence. The tutor is not only a teacher but also a friend."
- "I am very grateful for LVA. The best things in America are free."

An assessment of LVA's impact should thus include a review of the qualitative performance as well

Note: (1) Welfare benefits for a typical recipient in Aid to Families with Dependent Children, estimated by Federal Reserve Bank of Cleveland. This economic impact is only partially captured in current study

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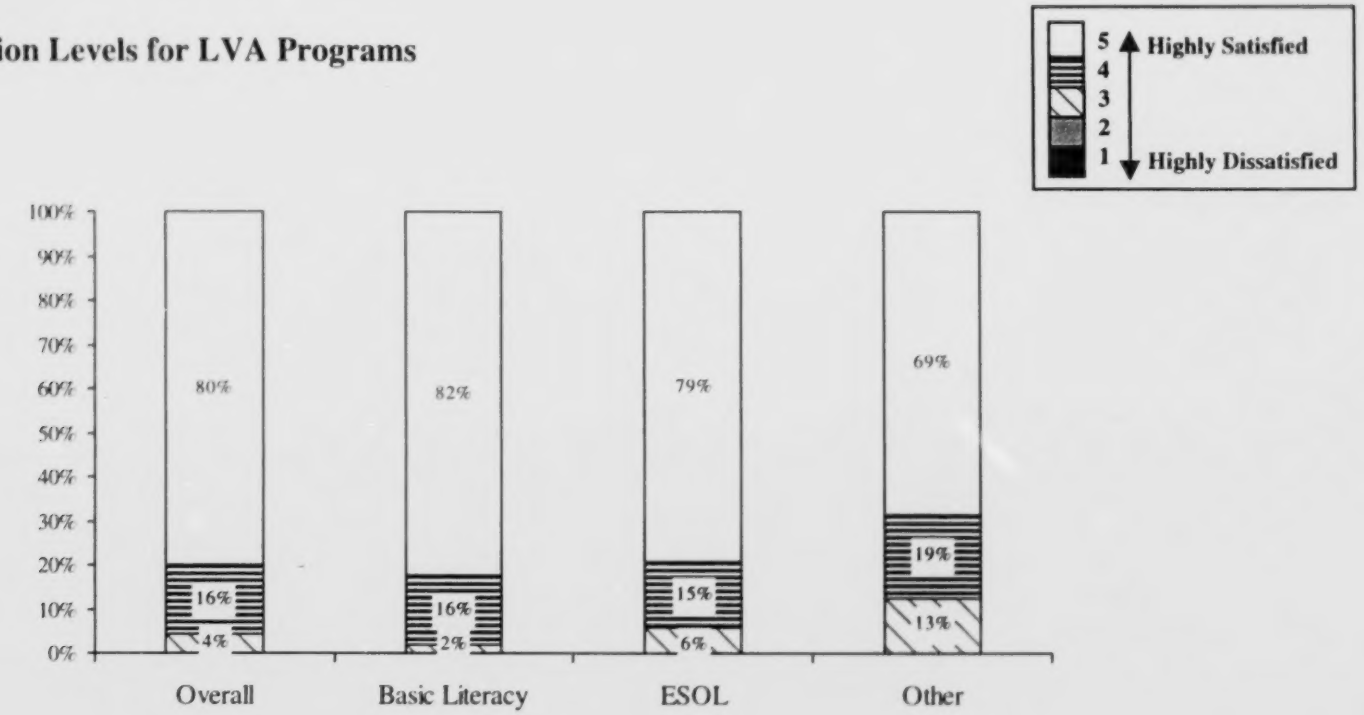
Learners are very satisfied with the improvements they have realized as a result of LVA's efforts

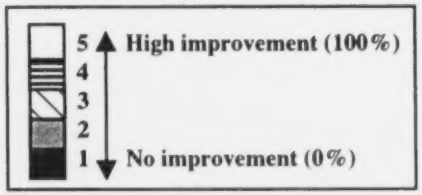
Satisfaction Levels for LVA Programs



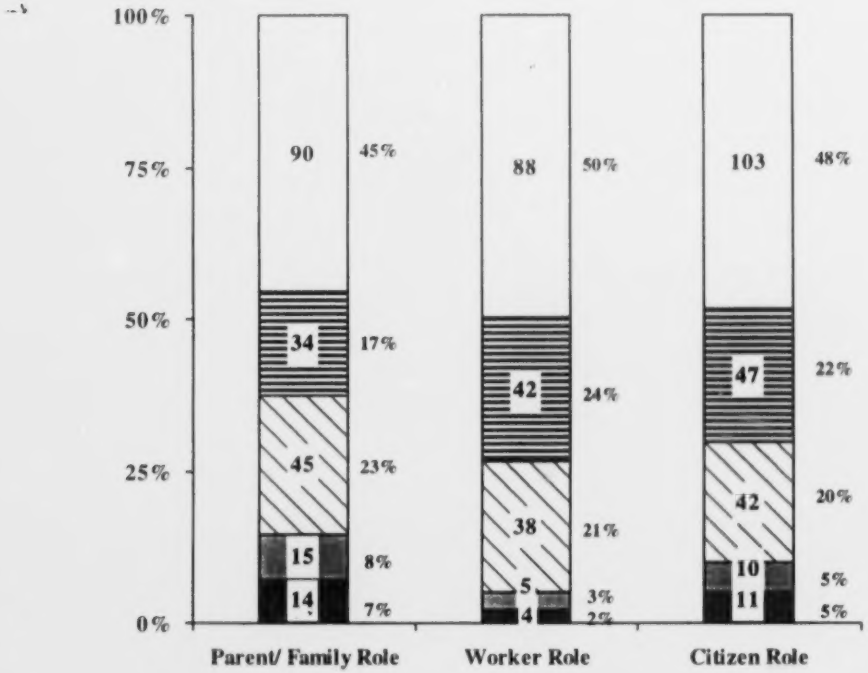
Number of learners in sample responding[1]	**216**	**123.5**	**76.5**	**16[2]**

Notes: (1) Students enrolled in both ESOL and basic literacy programs are counted as 0.5 under each program
(2) Other includes family literacy, citizenship, GED and computer classes

LVA learners are more *Equipped for the Future* as a result of improved literacy skills



Number of Respondents Who Indicate Improvement in *EFF* Roles

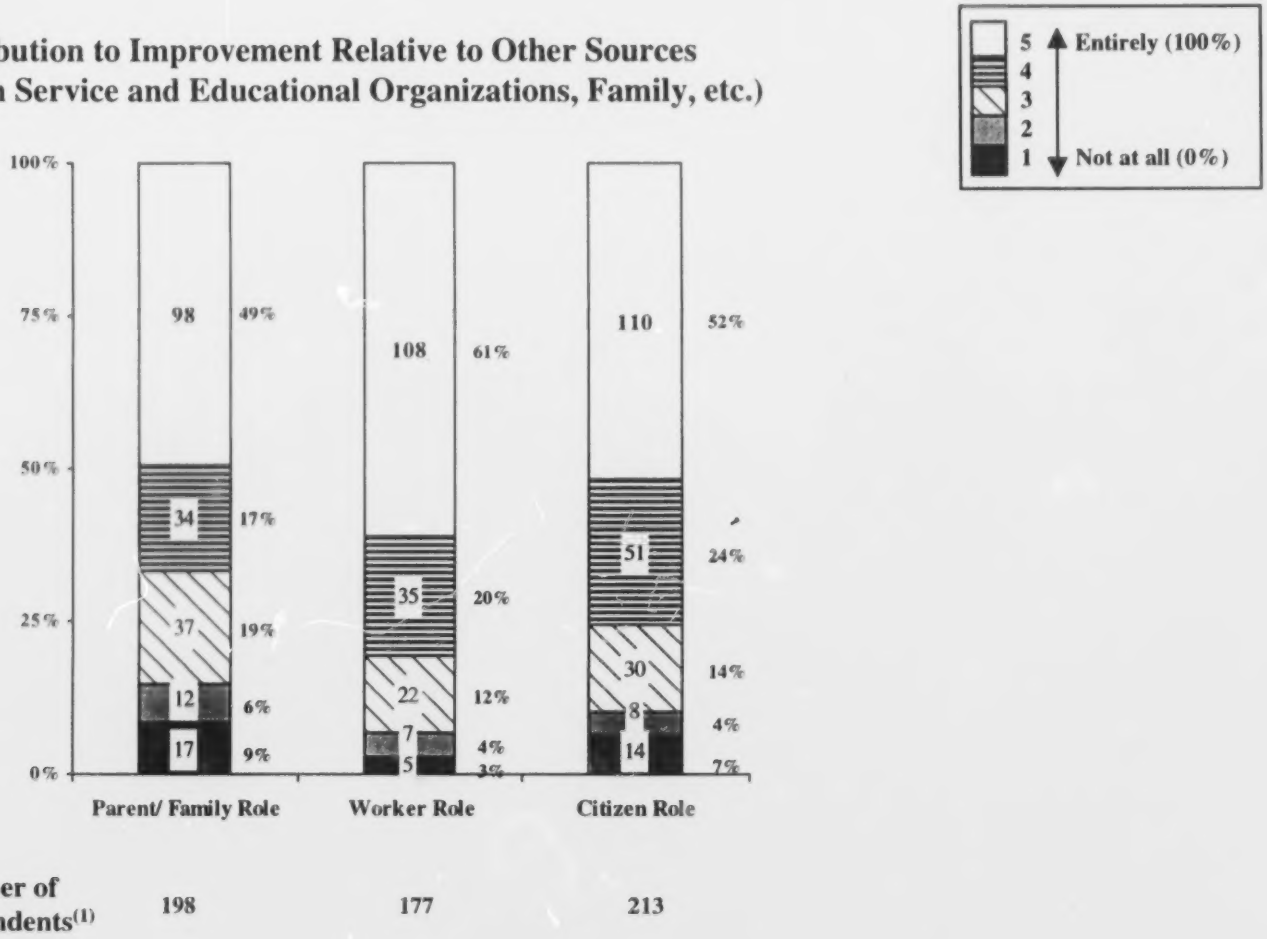


	Parent/ Family Role	Worker Role	Citizen Role
Number of respondents(1)	198	177	213

Note: (1) Number of respondents varies across the roles as some roles were not applicable for some respondents or some respondents chose not to answer few questions

LVA has been the primary source in enabling learners to achieve improvements in their lives

LVA's Contribution to Improvement Relative to Other Sources (Other Human Service and Educational Organizations, Family, etc.)

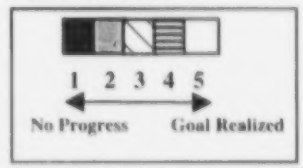


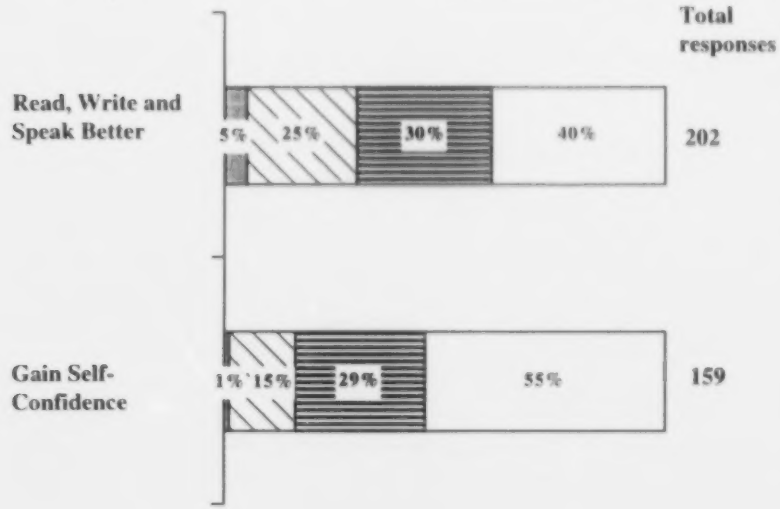
Note: (1) Number of respondents varies across the roles as some roles were not applicable for some respondents or some respondents chose not to answer few questions

Survival Skills

Learners have acquired basic survival skills which enable them to be more successful in all aspects of their lives...

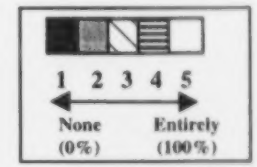
Extent of Goal Achievement

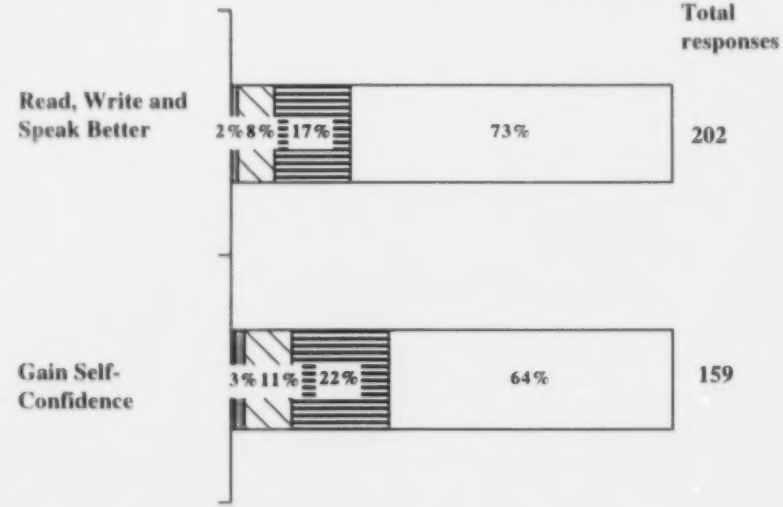




...and attribute this improvement primarily to LVA

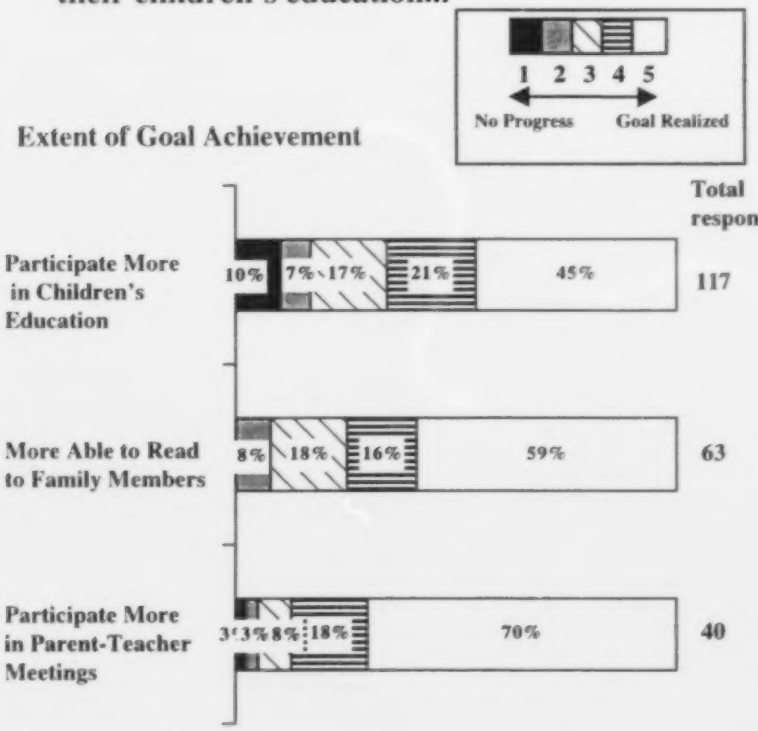
LVA's Contribution to Improvement



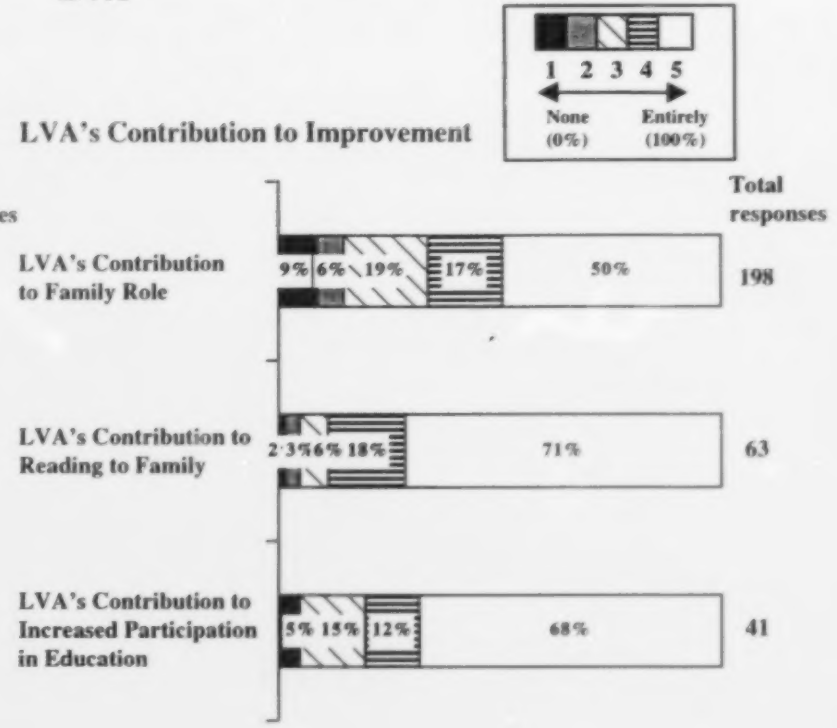


Parent/Family Role

Parents are participating more actively in their children's education...



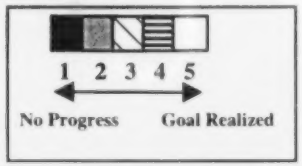
...and attribute this improvement primarily to LVA

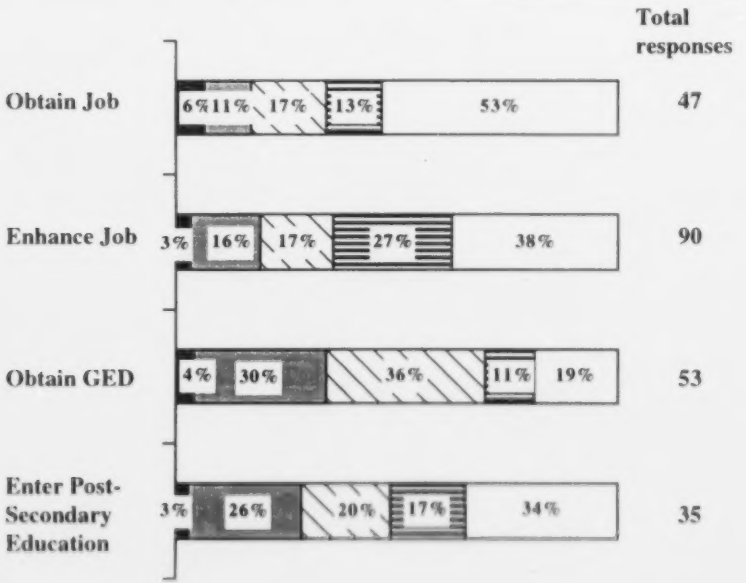


Worker Role

Many learners have enhanced their employment skills by achieving higher levels of employment and education...

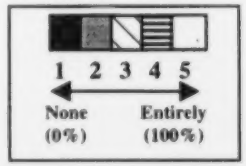
Extent of Goal Achievement

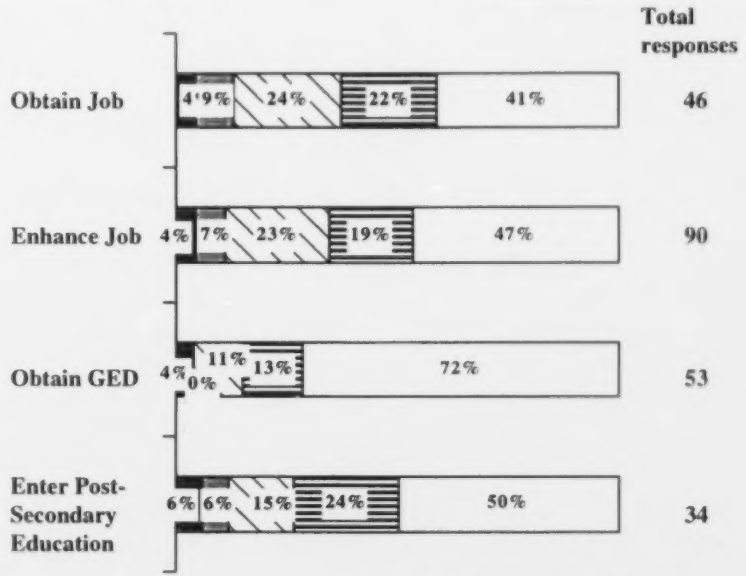




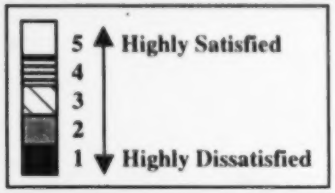
...and attribute this improvement primarily to LVA

LVA's Contribution to Improvement

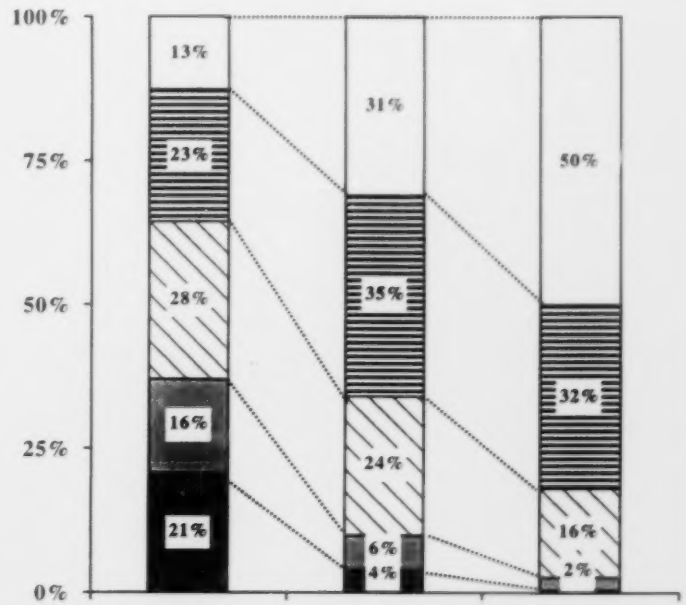




Job satisfaction has increased significantly since enrollment



Job satisfaction reported by interviewees has improved significantly



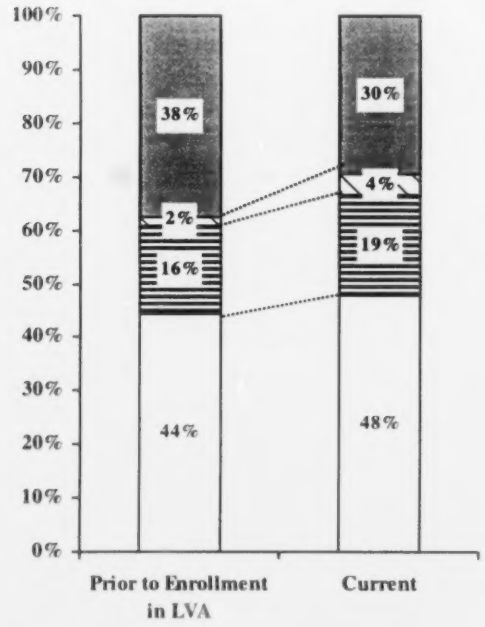
Implications of Satisfied Employees(2),(3)

- Workers Job Satisfaction has more of an impact on profits than research and development, technology, strategy, or emphasis on quality
- The way people are managed and developed accounts for 19% of the variation in profitability between companies
- "Employers should keep employees happy if they want to make money"
- "The more satisfied workers are with their jobs, the better the company is likely to perform in terms of profitability and particularly productivity"
- Job satisfaction is the strongest predictor of turnover; turnover costs for organizations range from $400 to $4,700 per employee

Notes: (1) Number of respondents varies as question was not applicable for some respondents
(2) Business: The Economy Profiting From Happy Workers, report by the University of Sheffield and London School of Economics, October 12, 1998
(3) *Employee turnover intention and professional orientation*; Public Administration Quarterly, Summer 1998

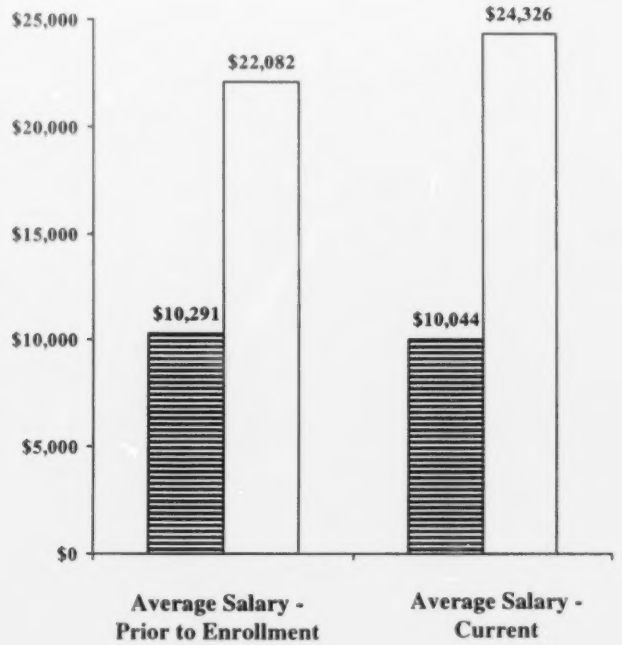
Many unemployed adults have obtained jobs since they enrolled in LVA

Employment Status of Learners



Number of respondents	217	217

Normalized Average Earnings of Learners (in 1999 dollars)



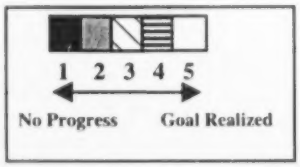
Number of respondents	29	73	39	103

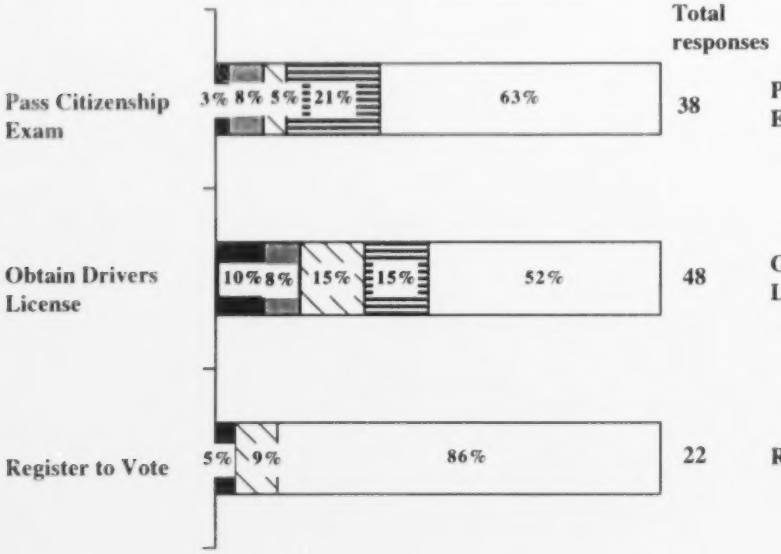
Average earnings remain relatively steady as new workers enter the labor force at lower wages

Citizen Role

Adults are becoming more involved in their communities...

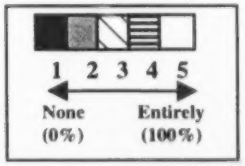
Extent of Goal Achievement

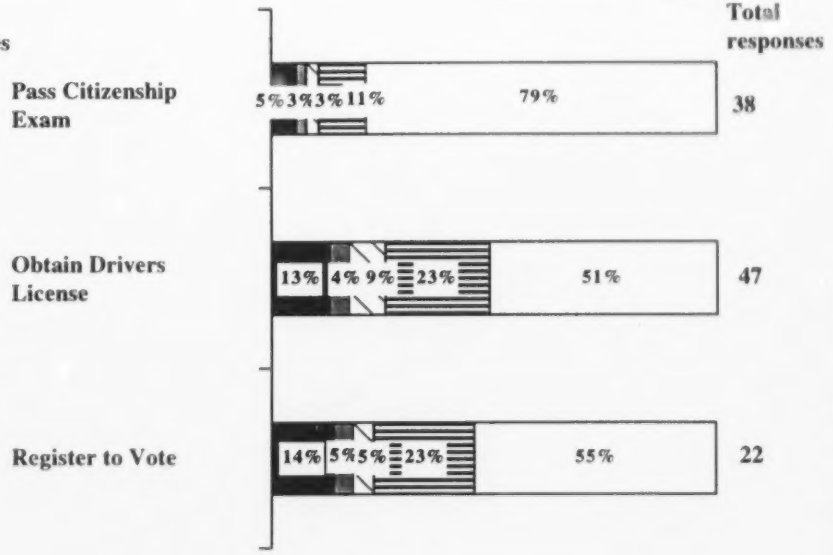




...and attribute this improvement primarily to LVA

LVA's Contribution to Improvement





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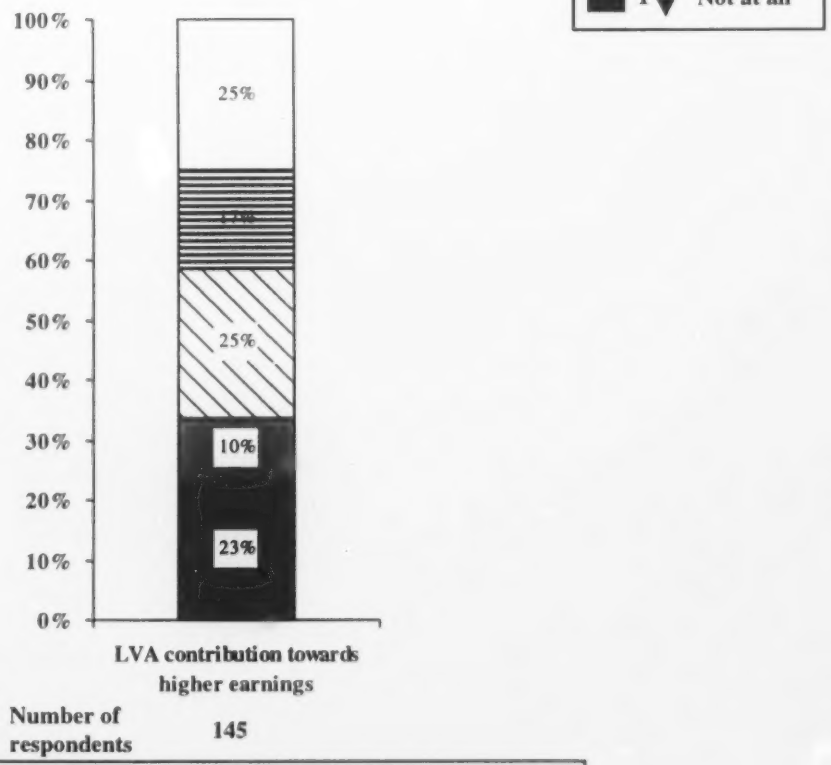
Many LVA students have received assistance from other programs in addition to LVA

42% of students have received assistance from other adult education programs...

Number of students who have received assistance from other literacy/ ESOL programs	91 students
Average number of hours per week in other literacy programs	9.0 hours
Range of frequency of participation in other programs (hours per week)	1.0 hours - 40.0 hours
Average enrollment period in other programs (total months)	14.1 months
Range of enrollment periods in other programs (total months	0.25 months- 84.0 months

...most students attribute more improvements to LVA (1)



Many interviewees felt that the class structure of other adult education programs and the one-to-one tutoring provided by LVA nicely complemented each other

Note: (1) Students were asked to indicate LVA's contribution relative to contribution from other agency(ies), their own motivation and other factors

Approach

The analysis included three key steps

1. Interviews
   - Developed student interview guide based on adult education research, visits to LVA affiliates, input from LVA staff, and participant feedback
   - Scheduled interviews based on random selection of students and availability
   - Conducted student interviews in Wisconsin and New York(1)

2. Analysis of Economic Impact
   - Developed analysis methodology and economic benefit and cost calculations
   - Transcribed interview data to excel database
   - Identified key assumptions
   - Developed an excel model
   - Conducted sensitivity analysis

3. Statistical validation and analysis
   - Conducted statistical analysis to determine key variables
   - Analyzed key variables for significance of sample size compared with national data

Note: 1. New York and Wisconsin were chosen as sample populations due to logistical considerations and the representative nature of the programs and the population being served

A framework for the interview process was developed based on visits to LVA affiliates, adult education research and academic feedback

Interview Guide Design

- Specific economic accomplishments such as obtaining employment, improvements in salary and/or benefits, reduction in dependence on public assistance, etc., were identified to provide a quantifiable measure of LVA's impact as well as a baseline of students entering the program
- Overall satisfaction levels, changes in effectiveness as a parent, citizen, and employee were captured along with LVA's contribution level, to measure LVA's success in ensuring that students are *Equipped for the Future*
- Individual goals and accomplishments (e.g., gaining citizenship, obtaining drivers license, reading to children, etc.) as well as LVA's contribution to each of these outcomes were captured to assess the magnitude of impact made by LVA
- Open-ended questions were included throughout the interview guide to incorporate individual comments and capture unique experiences and accomplishments
- Enrollment periods, frequency of attendance, types of instruction and demographic information were also gathered (mostly from interviewees' file) to ensure that the sample was representative of LVA across the organization

Interviewing Process

- Interview participants were selected at random and contacted by each of the participating LVA affiliates
- Prior to each interview, interview guides were filled in with information included in the interviewee's file
- At the start of each interview:
  - The interviewer gave the participant a brief introduction to the study
  - The interviewer assured each participant that all answers would be kept confidential
  - The interviewee was asked to sign a release form allowing LVA and A.T. Kearney to use student files and answers for the purpose of the study
- During the interview, participants were asked to provide both quantitative and qualitative responses
  - Some questions required interviewees to translate their responses into a scale measure
  - Some questions asked for specific numbers
  - Others were designed to encourage open feedback
- Most interviews were completed between 45 to 60 minutes
- At the conclusion of each interview, interviewees were given a $20 token of appreciation and a letter from LVA thanking them for their participation

Interviews were conducted at Wisconsin and New York over a period of three weeks

Interview Locations
▪ Conducted interviews at Eau Claire, Wisconsin, and various New York affiliates **<u>June 7 thru June 11, Wisconsin</u>** • Eau Claire • Menomonie **<u>June 21 thru June 25, New York</u>** • Albany • Schenectady • Troy • Syracuse • Oswego • Canandaigua (Ontario county) • Rochester • Belmont (Allegany county) • Dunkirk (Chautauqua county) • Buffalo **<u>June 28 thru July 1, New York</u>** • Middletown • Kingston (Ulster county) • Poughkeepsie (Dutchess county) • Nassau county • Suffolk county

Interview Details
▪ There were four interviewers in New York and three interviewers in Wisconsin
▪ There were less than 10% no shows overall, substitutes were identified and interviewed when possible
▪ A total of 219 interviews were conducted, (165 in New York and 52 in Wisconsin)
▪ Some interviews were conducted in a foreign language with the help of an interpreter
▪ Interviews were conducted in a private area to ensure confidentiality and increase participant level of comfort
▪ Most interviews were conducted one-on-one with the student to ensure confidentiality

To analyze the Economic Impact, direct and indirect economic components were approached differently

Conceptual Calculations

Economic Impact =

Economic Benefits / LVA costs

Direct Economic Component

- Obtained job
- Enhanced career
  - Improved earnings (raise/promotion)
  - Obtained better job
  - Obtained GED(1)
- Maintained job
  - Obtained drivers license
  - Obtained GED(1)
  - Improved reading, writing, and speaking skills required for current job
- Reduced dependence on welfare/public assistance

Quantitative Approach

- Quantify economic benefit of new/better job
- Quantify criticality of obtaining certain outcomes towards maintained current job
  - Obtained drivers license
  - Obtained GED(1)
  - Improved reading, writing, and English proficiency skills required for current job
- Quantify reduced dependence on welfare/public assistance (cash, food stamps)
- Assess contribution of LVA in achieving economic benefit

Indirect Economic Component

- Gained self-confidence
- Improved reading, writing, speaking test scores
- Obtained citizenship
- Registered to vote
- Voted for the first time
- Read to children
- Participated more actively in children's education, parent/teacher meetings, etc.

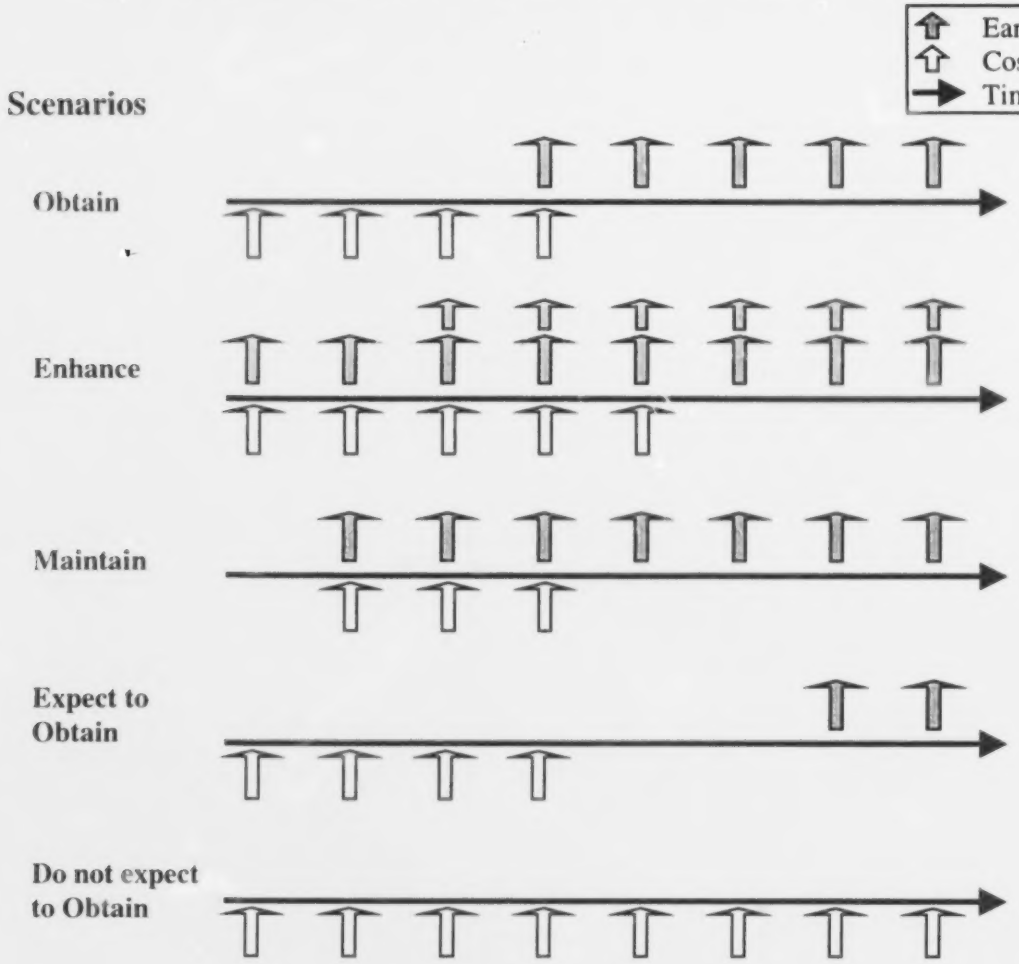
Qualitative Approach

- Assess overall satisfaction with improvements in life as a result of LVA efforts
- Assess improvement in key roles based on Equipped For Future study
  - Family role
  - Worker role
  - Citizen/community role
- Further assess level of achievement of various outcomes and LVA's contribution level to achievements

A.T. Kearney 7/29299/B 31

Note: (1). GED = General Educational Development Test, equivalent to completing High School Diploma

In analyzing the direct economic component, five key scenarios were considered



Student Examples
■ No job, started with LVA ■ Obtained GED with LVA assistance ■ Obtained a job, quit LVA
■ Had job, started with LVA ■ Improved literacy skills ■ Promoted to Shop Floor manager due to new skills, enhanced earnings ■ Continued with LVA for several years to further improve literacy skills, then quit LVA
■ Had job, required Commercial Drivers License (CDL) to continue to maintain job ■ Started with LVA ■ Passed CDL test with LVA assistance ■ Maintained job, quit LVA
■ No job, started with LVA ■ Improved literacy skills, joined Vocational Technology College with LVA assistance ■ Quit LVA, completed VoTech degree ■ Obtained a job as a skilled automotive mechanic
■ No job, joined LVA to improve literacy skills and be a role-model to children ■ Participating actively in children's education ■ Children's grades improve considerably

Since the timing of costs and benefits vary considerably from year to year, costs and benefits are analyzed over a period of time to capture LVA's value generation

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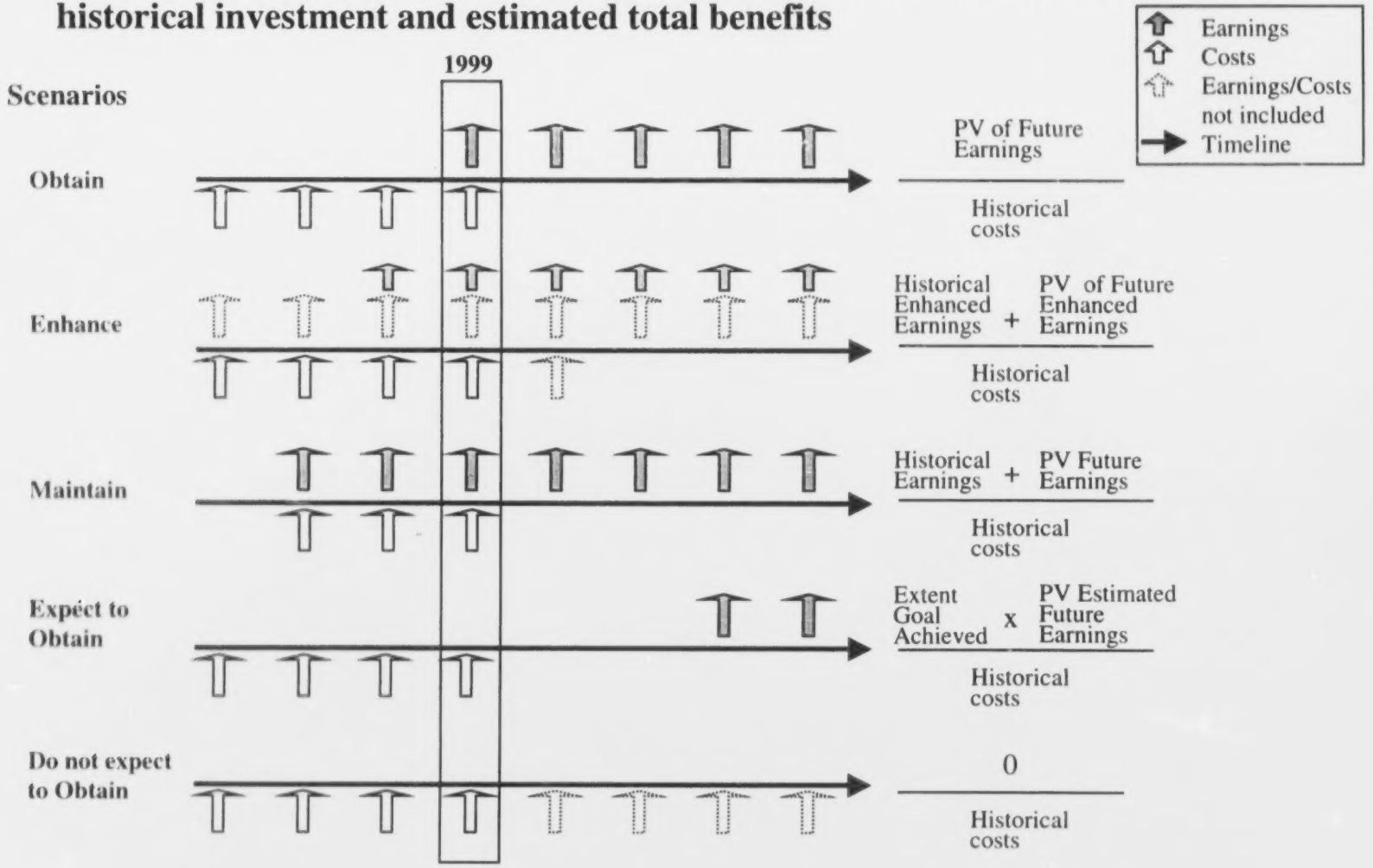
The analysis approach measures economic impact over time by capturing historical investment and estimated total benefits



A comprehensive calculation[1] was used to measure economic impact over time

Scenarios...

Obtain

$$\left(\sum \text{Historical Earnings} + \sum \text{PV of Future Earnings} \right) \times \text{LVA Contribution} +$$

Enhance

$$\left(\sum \text{Historical Enhanced Earnings} + \sum \text{PV of Future Enhanced Earnings} \right) \times \text{LVA Contribution} +$$

Maintain

$$\left(\sum \text{Historical Earnings} + \sum \text{PV of Future Earnings} \right) \times \text{LVA Contribution} +$$

Expect to Obtain

$$\left(\text{Extent Goal Achieved} \times \sum \text{PV Estimated Future Earnings} \right) \times \text{LVA Contribution} +$$

Do not Expect to Obtain

$$\left(\cancel{\text{Extent Goal Achieved}}\ (=0) \times \sum \cancel{\text{PV Estimated Future Earnings}}\ (=0) \right) \times \text{LVA Contribution} +$$

Welfare

$$\left(\sum \text{Historical Public Assistance Avoided} + \sum \text{PV Estimated Public Assistance Avoided} \right) \times \text{LVA Contribution}$$

$$\div \left(\sum \text{Historical LVA}^{(1)} \text{ costs} + \sum \text{Historical}^{(2)} \text{ Tutor costs} \right)$$

Notes: (1) Represents effective calculation equivalent to applying a weighting method to accurately reflect LVA costs during students' enrollment period across all students
(2) Includes Affiliate, National and (when applicable) Midlevel organization costs
(3) Included to calculate economic impact with tutor hours

An Excel model was developed to compute the economic impact ratio based on key assumptions

- Average annual wage increases as published by the Bureau of Labor Statistics for New York and Wisconsin were used to adjust all earnings to 1999 dollars
- Implications of Welfare Reform policies (maximum of 24 consecutive months on welfare) were accounted for when calculating benefits resulting from reduced dependence on public assistance
- Benefits from future earnings were limited to a certain number of periods (with a maximum of retirement age for high level ratio)
- The value of volunteer time was valued at the national average hourly wage as published by the Bureau of Labor Statistics to reflect the opportunity cost of the tutor's time
- The class size for small group sessions was varied in each scenario to reflect impact of group sizes and resulting differences in cost per student under each scenario
- The level of LVA's contribution was slightly reduced under the low and middle scenarios to ensure a conservative measure and to account for possible overstatements by participants during the interview process
- The economic multiplier for wages was applied to benefits in earnings to address the incremental impact of each dollar earned on the economy beyond actual wages (this number was adjust +/- 10% under the low and high scenarios)
- Employee benefits as a percentage of wages were calculated to reflect total changes in earnings
- Potential future earnings of unemployed students were based on average wages achieved by those who obtained a job as a result of participating in an LVA program (the change in average starting wages between the low, medium and high values reflects the impact of employee benefits on overall earnings)
- An annual productivity increase of 1.0%, 2.0% and 3.0% were used under the low, middle and high scenarios, respectively, to account for higher performance ability on the job due to better literacy skills

To further understand the data, the distribution of the economic impact ratio was analyzed

Key Findings and Statistics

- The distribution of individual economic impact ratios indicates that it is not a Normal distribution[1] and has a large standard deviation[2], implying that there is large variation in economic impact across students
- The economic impact is best described as being between 14.7 and 24.5 and having an average of 19.7 at a 90% confidence interval[3]
- The individual economic impact ratios were weighted by the total amount spent by LVA during the period of the individual's enrollment to accurately reflect the individual's impact in the overall ratio
- The weighted average economic impact is between 8 and 13.4 and averages 10.7 at a 90% confidence interval[3] when tutor hours are included as a cost
- The weighted average economic impact is between 24.6 and 41.5 and average of 33 at a 90% confidence interval[3] when tutor hours are not included as a cost

Note: 1. Distribution is "right" skewed, best described as an exponential distribution
2. Standard deviation is 36.6, median is 5.2
3. If the sample is repeated multiple times, 90% of the times the average will fall within the specified range

Testing the statistical validity of the data required analysis beyond the traditional linear regression models

Observations	Implications
▪ Economic Impact data is right skewed[1] and appears to follow an exponential distribution	▪ Data does not easily support a linear regression model ▪ The relationship between independent variables (such as Age, Program, Gender, etc.) and the dependent variable (Economic Impact ratio) is much more complex (non-linear) ▪ Multiple subgroups of the variables (for example Active Female students, between the Ages of 25 and 34, in ESOL programs may drive the Economic Impact ratio) ▪ Data sample size may need to be increased to provide for significance at the various subgroup/conditional variable levels
▪ A more complex analysis will be required to identify relationships between the dependent variable (Economic Impact ratio) and independent variables (such as Age, Program, Gender, etc.)	▪ Explored other analyses to identify a relationship including Discriminant analysis and Categorical and Regression Tree analysis (CART) ▪ CART is a good tool for identifying complex relationships in small metric or continuous data samples and was selected for further analysis ▪ CART is a technique to decompose data into subgroups in a way to maximize the differential between average ratios

Note: 1. When the slope of the histogram is towards the right, data is assumed to be "right" skewed

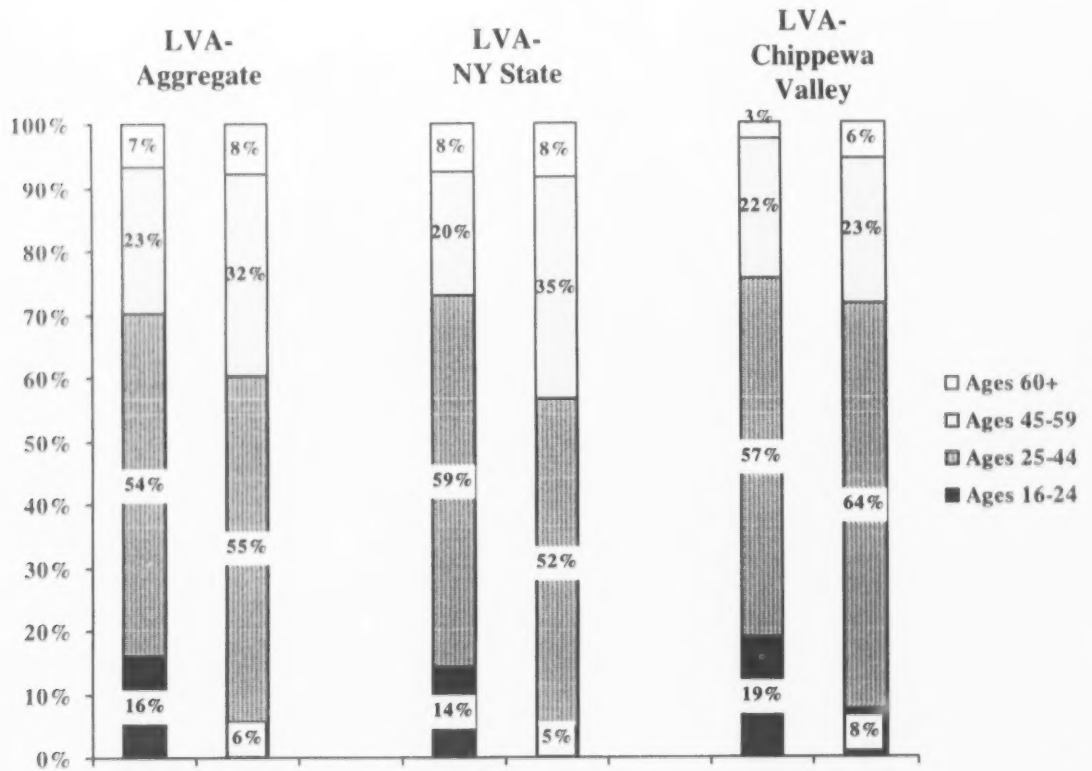
Statistical tests indicate that while program type is statistically significant, inactive students are underrepresented, thus potentially understating the true Economic Impact of the services that LVA provides

Findings from CART analysis and significance tests of key variables in sample		
Key Variables[1]	**Value**	**Implications**
Economic Impact (EI)	19.7	• At 90% confidence interval[2], the non-weighted economic impact falls between 14.8 and 24.5 (or +/- 4.9) economic value created for every dollar invested
Type of Program • Non-Basic Literacy[3]	30.2	• Non-basic literacy students (i.e. students in ESOL and Other programs) tend to produce a higher incremental value per dollar of cost • The non-basic literacy students are adequately represented in the sample data
Type of Program • ESOL	27.9	• ESOL students tend to have a high Economic Impact • The ESOL students are adequately represented in the sample data
Enrollment Status • Inactive	31.2	• Inactive students also tend to have a higher Economic Impact • Inactive students are underrepresented in the sample, as a result, overall Economic Impact, as calculated in the sample, potentially understates the true Economic Impact at national level

Note: (1) Variables are listed in the order of their importance as determined by their p-value or significance level
(2) If the sample is repeated multiple times, 90% of the times the average will fall within the specified range
(3) Some students were in more than one program, thus non-basic literacy students included some students who were in the ESOL program and another program

Profile of interviewees versus national student population

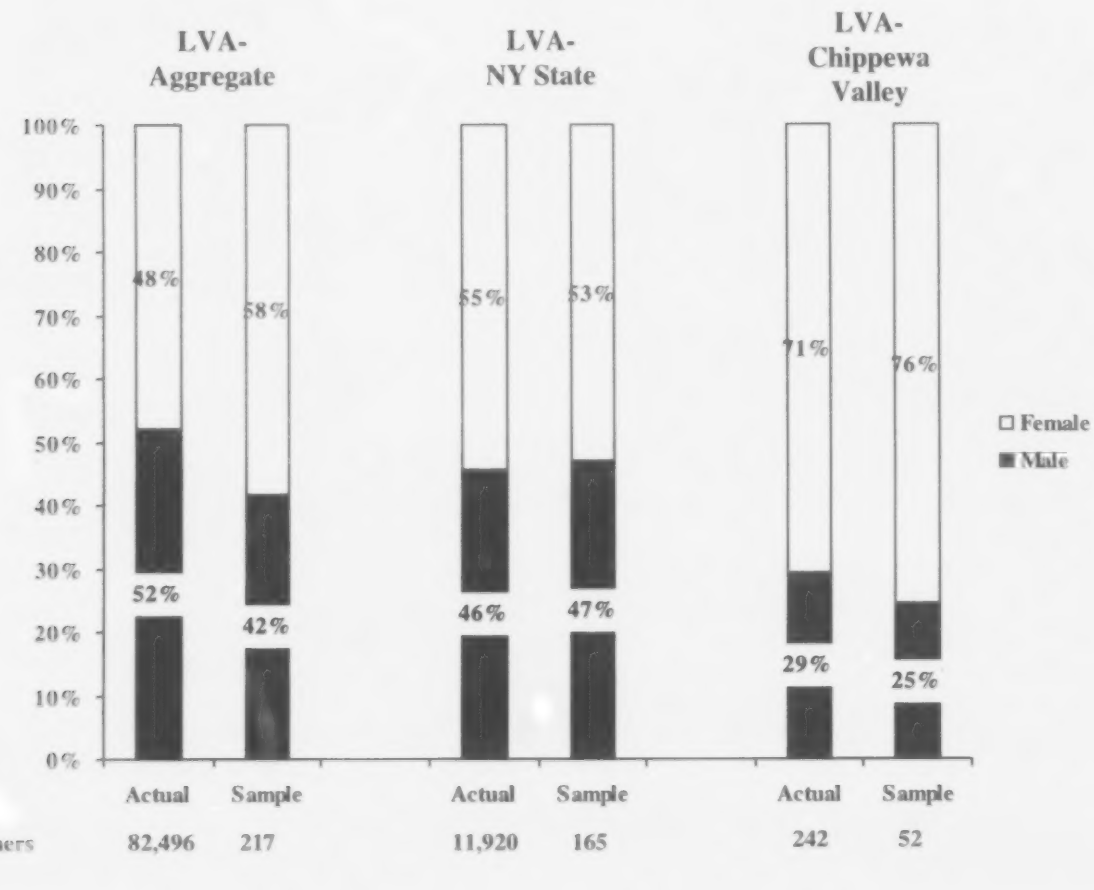
LVA population sampled—By Age(1)



	Actual	Sample	Actual	Sample	Actual	Sample
Total learners served	82,496	217	11,920	165	242	52

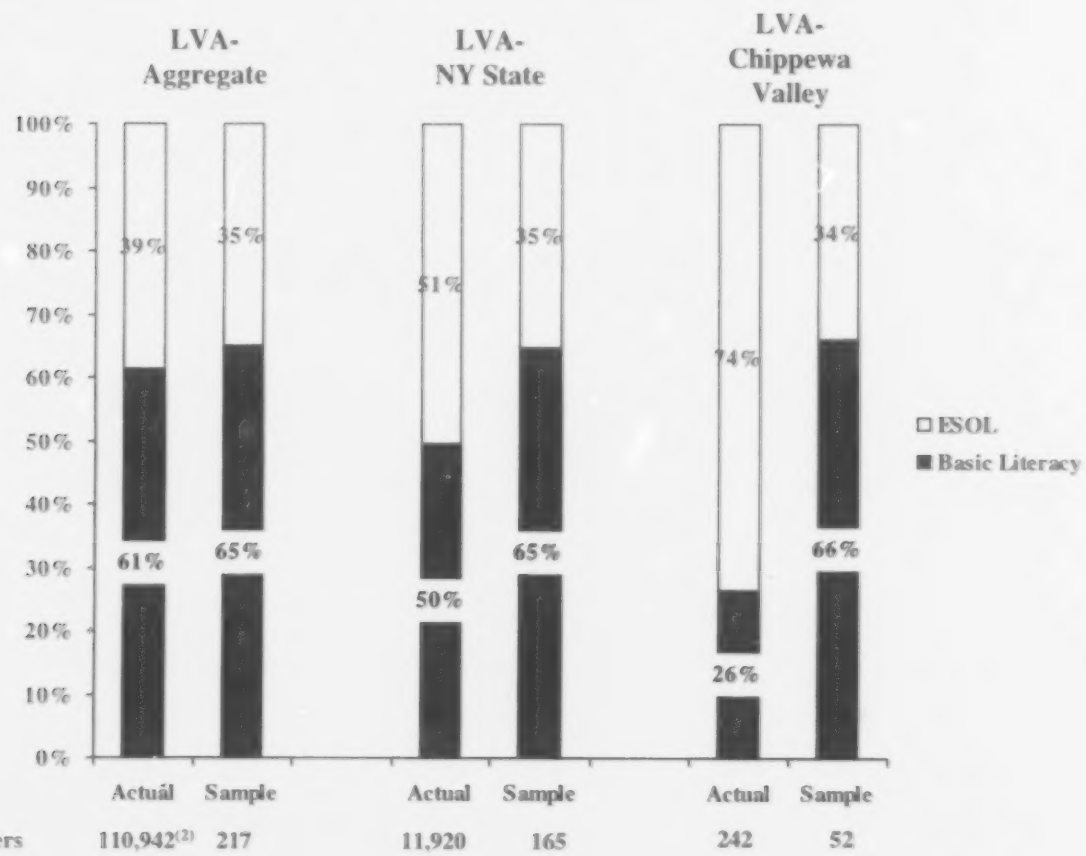
Notes: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question

LVA population sampled—By Gender[1]



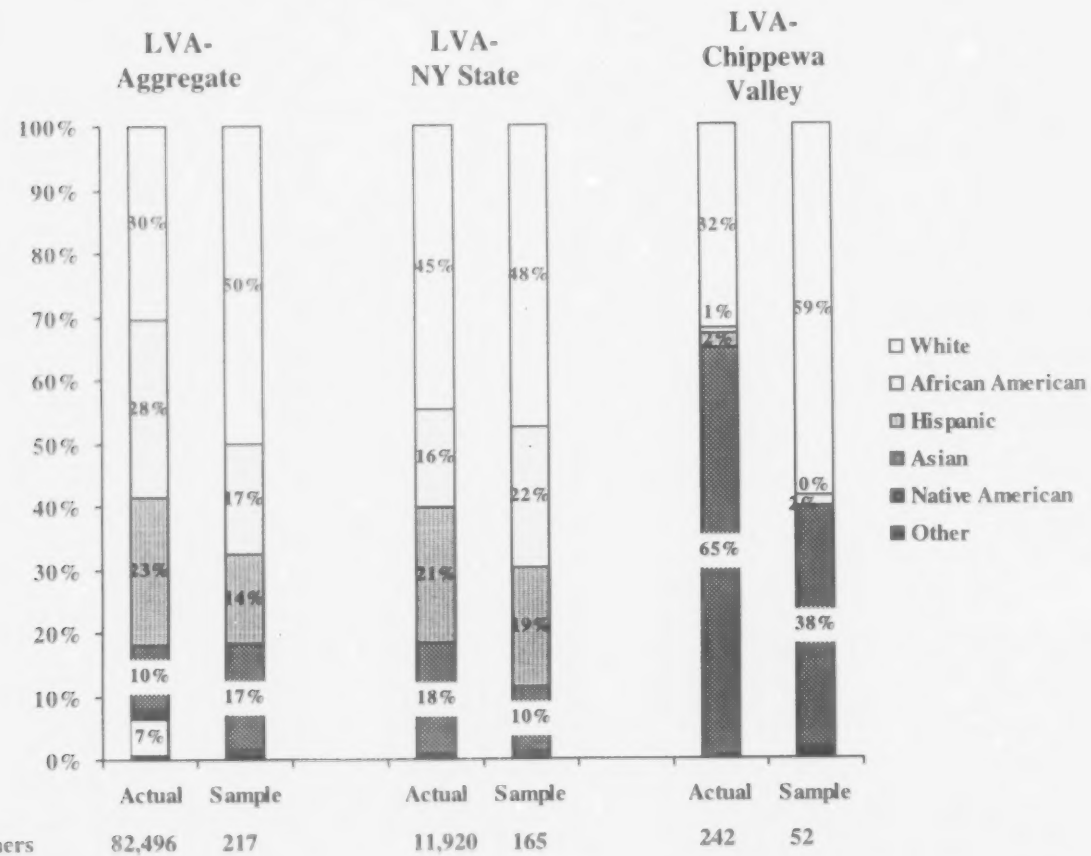
Notes: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question

LVA population sampled—Basic Literacy v. ESOL[1]



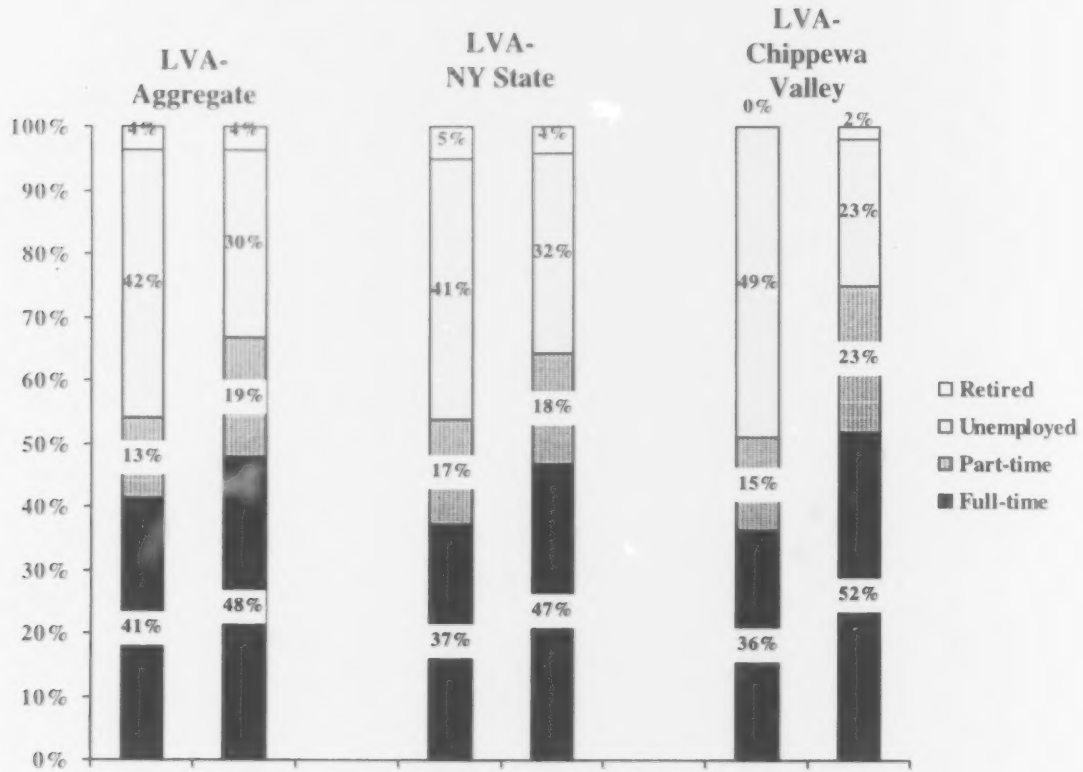
Notes: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question
(2) Students enrolled in both ESOL and Basic Literacy are counted under both programs

LVA population sampled—By Ethnicity(1)



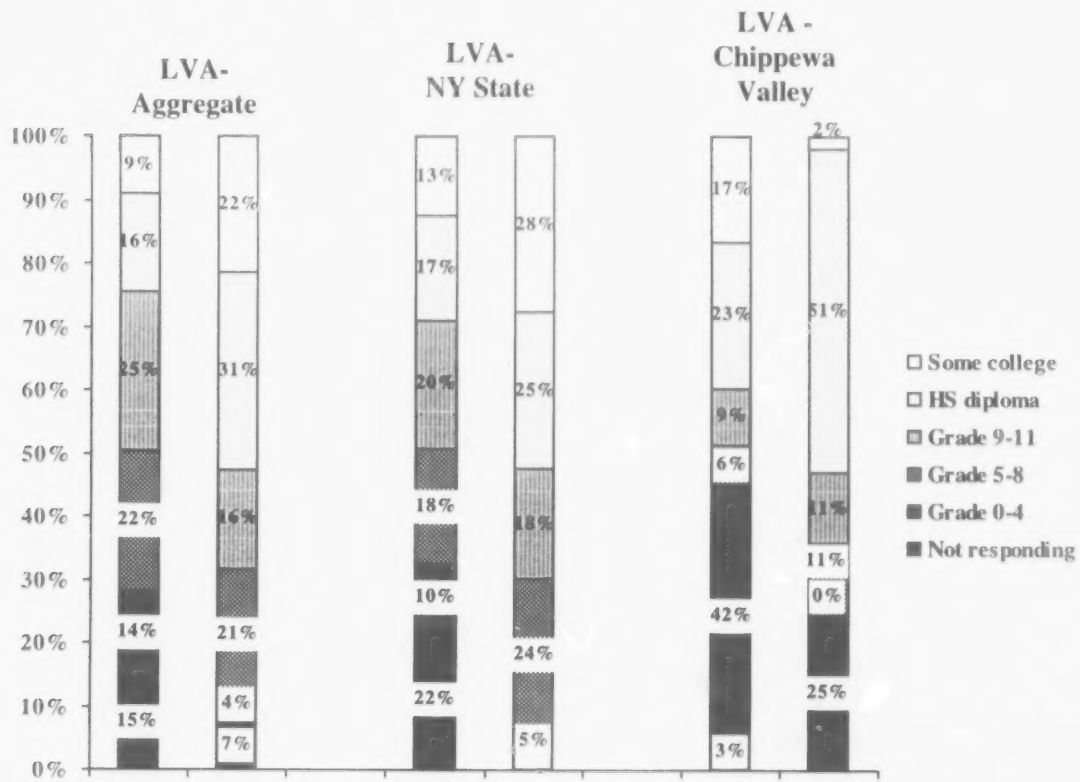
Notes: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question

LVA population sampled—By Current employment status (1)



Notes: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question

LVA population sampled—By Education Level(1)



	Actual	Sample	Actual	Sample	Actual	Sample
Total learners served	82,496	217	13,972	165	242	52

Note: (1) Actual based on fiscal 1998 (for the year ended June 30, 1998) LVA data for students responding to question

Next Steps
Pages 46-52 are
For Internal Purposes
Only

Appendix

Bibliography

1. Bureau of Labor Statistics; http://www.bls.gov.
2. *Business: The Economy Profiting From Happy Workers*; BBC News; report by the University of Sheffield and London School of Economics; October 12, 1998.
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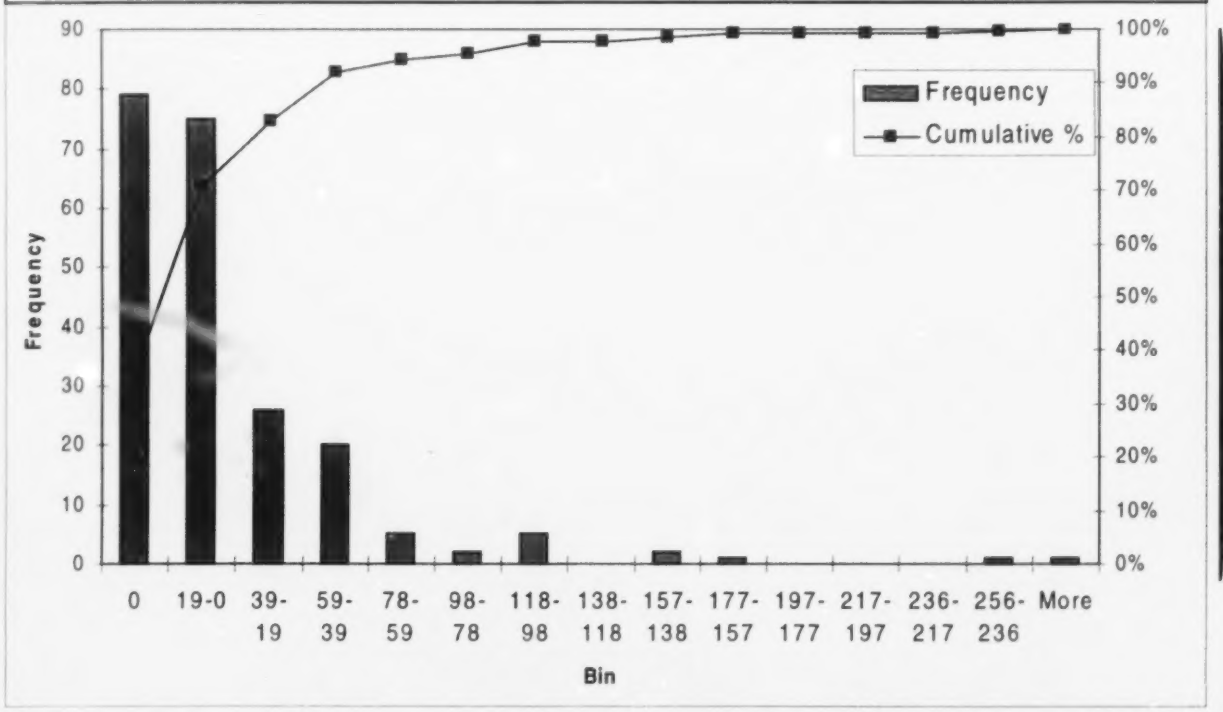
To further understand the data, the distribution of the economic impact ratio was analyzed

Distribution of Economic Impact ratio

Histogram of Individual Economic Impact ratios (non-weighted ratios)



Key Findings and Statistics

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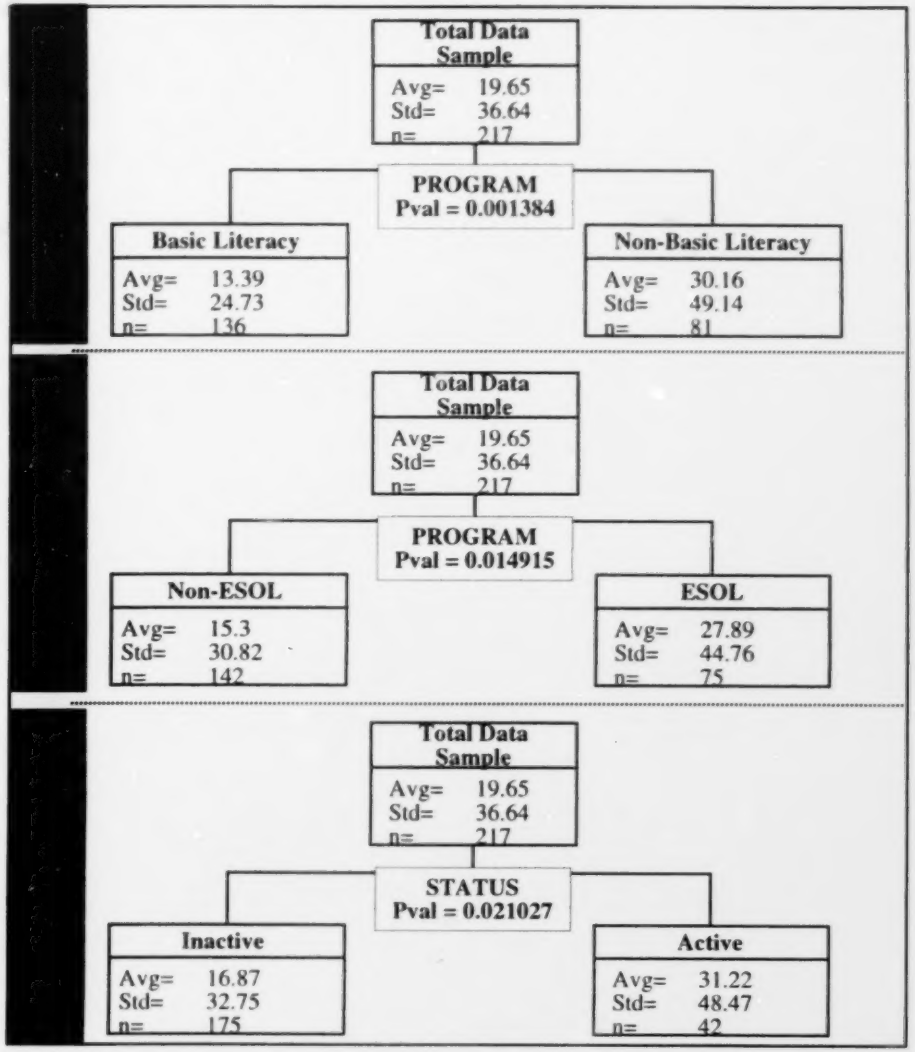
- The economic impact is best described as being between 14.7 and 24.5 and having an average of 19.7 at a 90% confidence interval[3]
- The individual averages were weighted by the total spent by LVA during the period of individual enrollment to accurately reflect the individual's impact in the overall ratio
- The weighted average economic impact is between 8 and 13.4 and average of 10.7 at a 90% confidence interval[3]

Distribution of economic impact ratio "describes" the data and has no implications on the "quality" of the data

Note: 1. Distribution is "right" skewed, best described as an exponential distribution
2. Standard deviation is 36.6, median is 5.2
3. If the sample is repeated multiple times, 90% of the times the average will fall within the specified ratio

Categorical and Regression Tree (CART) analysis identified two key variables at level 1 that drive Economic Impact: Program and Enrollment Status



Key	
Avg=	Average Ratio
Std=	Standard deviation
n=	Number of records
Pval =	Significance level

Implications

- Key variables that differentiate Economic Impact ratios are:
  - Type of program (ESOL or basic literacy)
  - Enrollment status (active or inactive)
- Students in ESOL and "Other" programs tend to have a higher economic impact ratio
- Future data samples should be designed to ensure significance at the subgroup or conditional level for high significance values